

**ADD R(a) + 5 → R(d)**

## Figure 1

The diagram shows four states in a 2x2 grid:

- Top-left: PPV = 1, CV = 1, 220
- Top-right: PPV = 0, CV = 0, 225
- Bottom-left: PPV = 1, CV = 0, 235
- Bottom-right: PPV = 0, CV = 1, 240

Transitions and labels:

- Top-left to Top-right: APV = 0
- Top-right to Top-left: APV = 1
- Top-left to Bottom-left: APV = 1
- Bottom-left to Top-left: APV = 1
- Top-right to Bottom-right: APV = 0
- Bottom-right to Top-right: APV = 1
- Bottom-left to Bottom-right: APV = 0
- Bottom-right to Bottom-left: APV = 1

Actions:

- From Top-left: 'Make Prediction' (self-loop), 'Insert Stalls' (to Bottom-left)
- From Bottom-right: 'Make Prediction' (self-loop), 'Insert Stalls' (to Top-right)

## Figure 2

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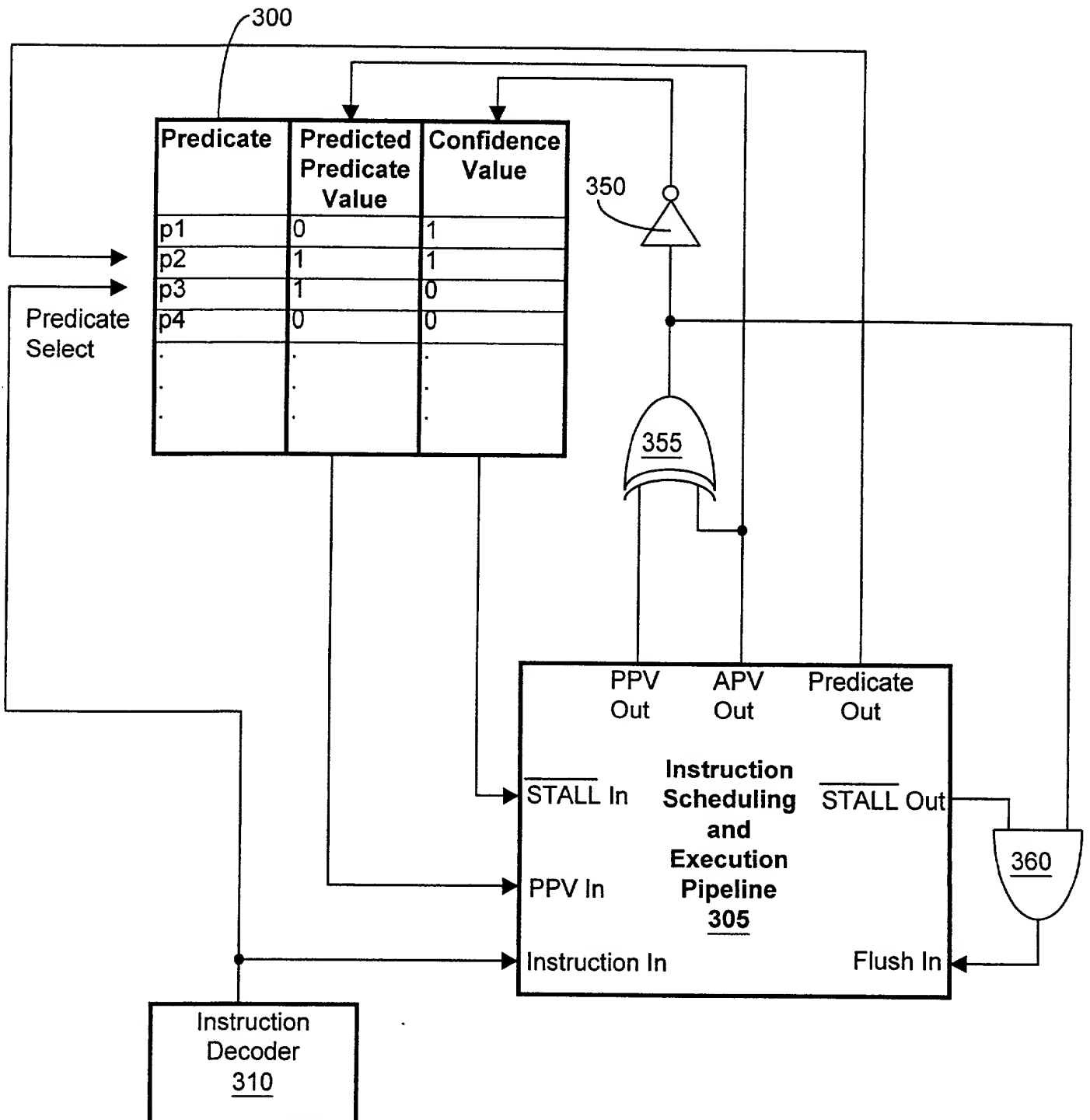
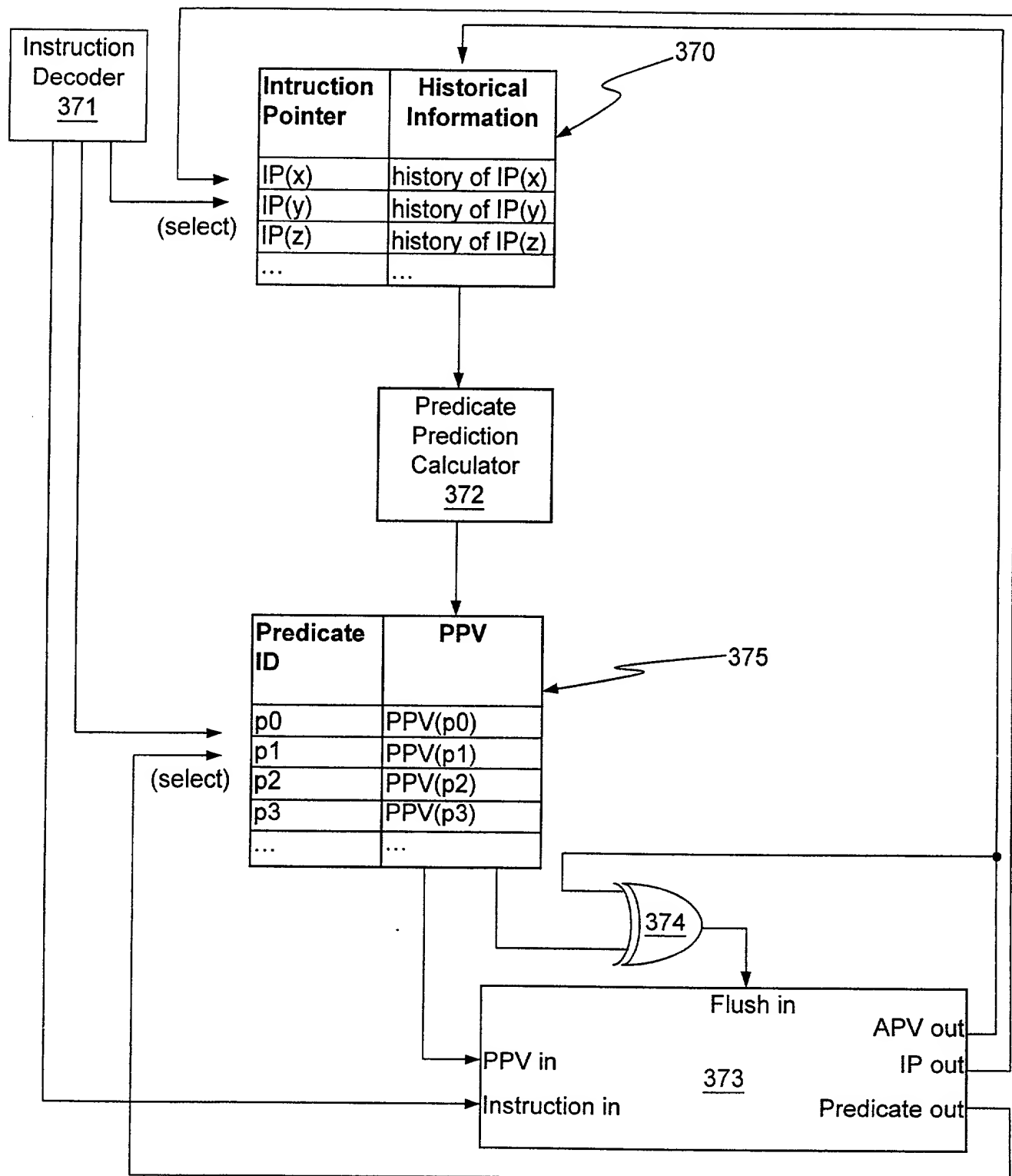
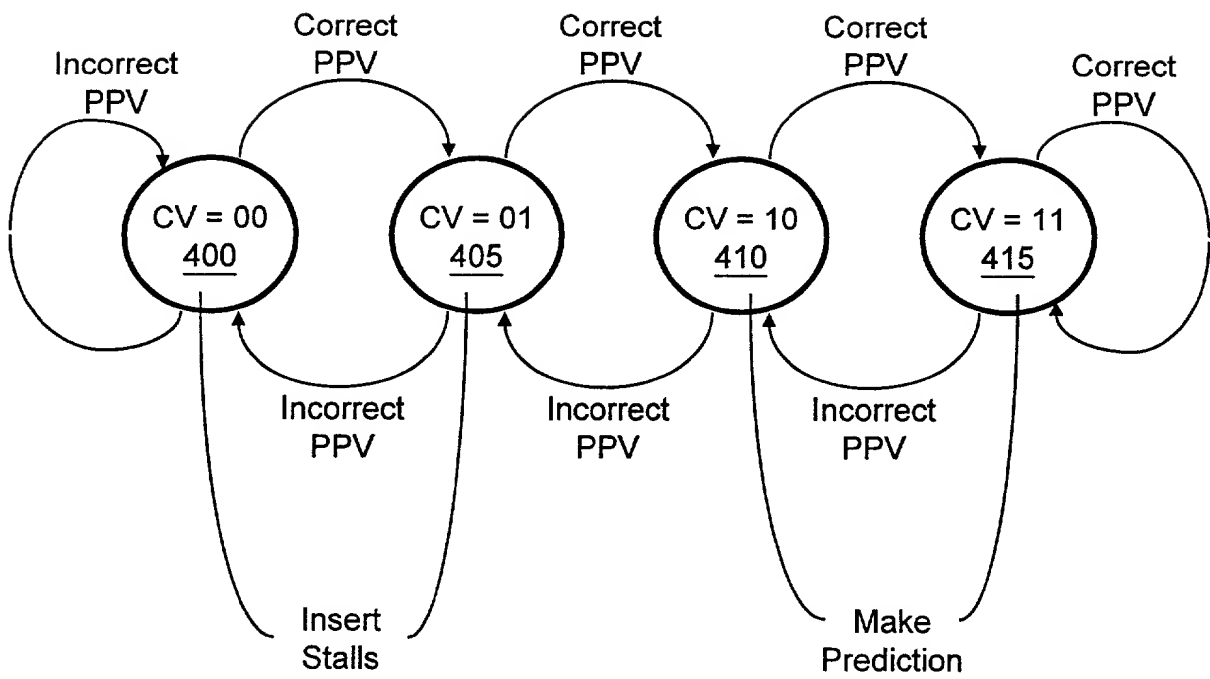


Figure 3A

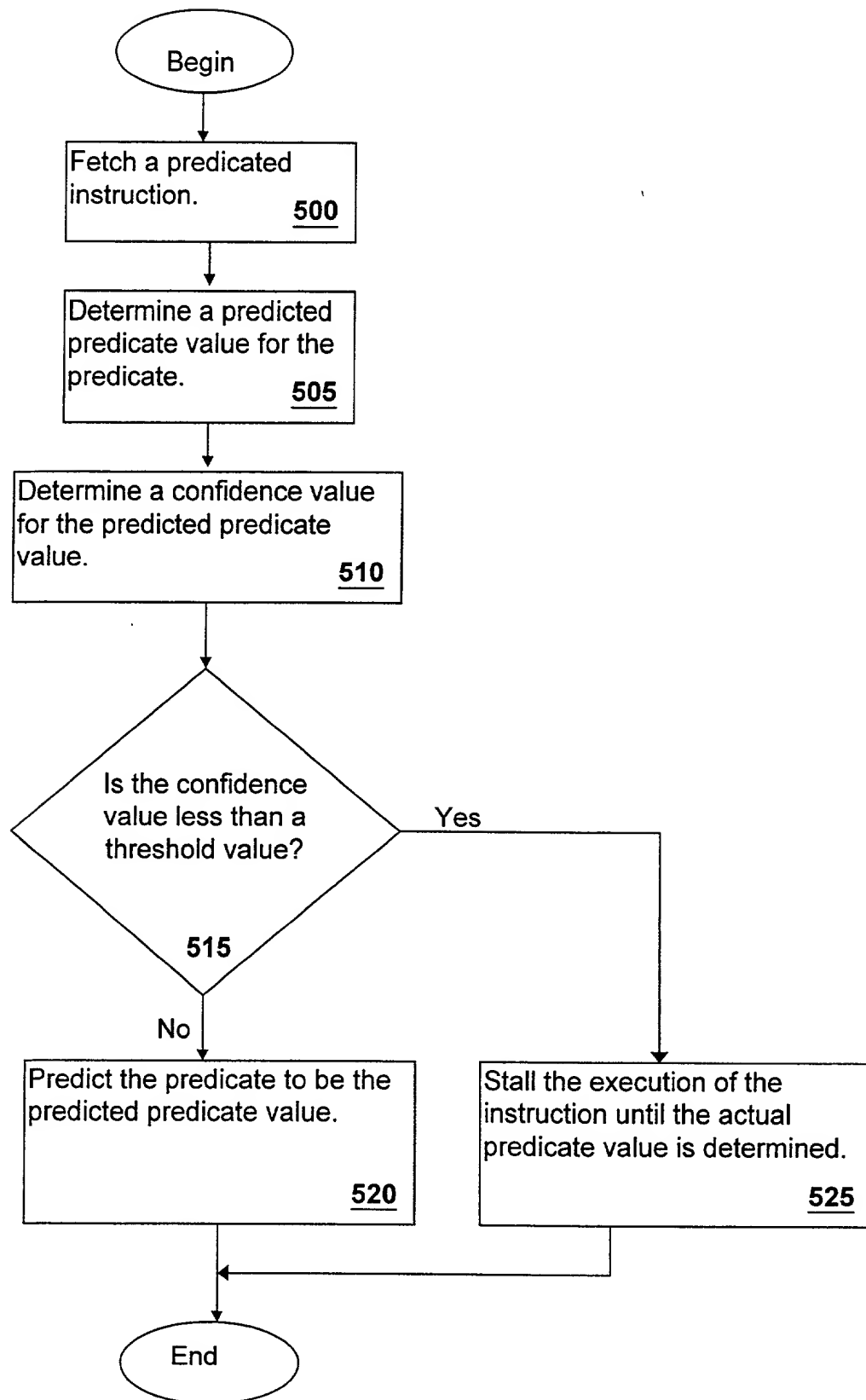
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**Figure 3B**



**Figure 4**



**Figure 5**

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graph TD
    Begin([Begin]) --> 600[Fetch a predicated instruction.  
600]
    600 --> 605{What is the PPV?  
605}
    605 -- True --> 610[Execute the predicated instruction.  
610]
    605 -- False --> 615[Treat the predicated instruction like a no-op.  
615]
    610 --> 615
    615 --> 620{Is PPV=APV?  
620}
    620 -- Yes --> End([End])
    620 -- No --> 625[Flush at least the backend of the pipeline, and replay beginning with the predicated instruction using the APV.  
625]
    625 --> 620
  
```

## Figure 6